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(54) **Stepped scroll compressor with staged capacity modulation**

(57) A scroll compressor has a stepped wrap such that there is a greater height outer portion (38;40) and a lesser height more central portion (42;44). Bypass ports (36) are associated with the transition zone between the higher and lesser height portions. By providing the bypass port in a stepped scroll compressor, greater reductions in capacity can be achieved than have been provided in the prior art.

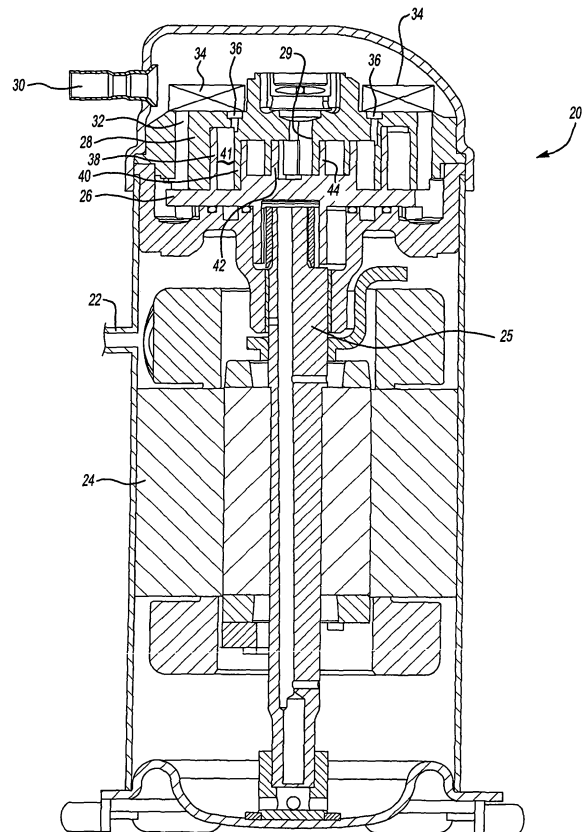


Fig-1

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EUROPEAN SEARCH REPORT

 Application Number
 EP 08 25 2231

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 507 085 A1 (MITSUBISHI HEAVY IND LTD [JP]) 16 February 2005 (2005-02-16) * figures 1-23 * * paragraphs [0001], [0003] * * paragraph [0007] * * paragraph [0026] - paragraph [0027] * -----	1-4	INV. F04C18/02 F04C28/26 F04C28/10
X	US 2006/140804 A1 (LEE BYEONG-CHUL [KR] ET AL) 29 June 2006 (2006-06-29) * figures 3-10 * * paragraph [0002] * * paragraph [0012] - paragraph [0014] * * paragraph [0043] - paragraph [0044] * -----	1-4	
X	US 2006/177332 A1 (KIM MYUNG-KYUN [KR] ET AL) 10 August 2006 (2006-08-10) * figures 3-11 * * paragraph [0002] * * paragraph [0012] * * paragraph [0038] - paragraph [0041] * * paragraph [0052] * -----	1-4	
Y	EP 1 004 773 A1 (DAIKIN IND LTD [JP]) 31 May 2000 (2000-05-31) * the whole document * -----	1-4	
Y	JP 58 030494 A (SANKYO DENKI CO LTD) 22 February 1983 (1983-02-22) * figures 1-8 * * abstract * -----	1-4	
A	US 4 383 805 A (TEEGARDEN ARLO F ET AL) 17 May 1983 (1983-05-17) * the whole document * -----	1-4	
A	DE 195 17 748 A1 (TOYODA AUTOMATIC LOOM WORKS [JP]) 23 November 1995 (1995-11-23) * the whole document * -----	1-4	
	-/--		
The present search report has been drawn up for all claims			
1	Place of search Munich	Date of completion of the search 2 July 2010	Examiner Sbresny, Heiko
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EUROPEAN SEARCH REPORT

Application Number
EP 08 25 2231

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 6 413 058 B1 (WILLIAMS JOHN R [US] ET AL) 2 July 2002 (2002-07-02) * the whole document *	1-4	
A	JP 5 071477 A (TOSHIBA CORP; TOSHIBA AVE KK) 23 March 1993 (1993-03-23) * figures 1-7 * * abstract *	1,4	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 2 July 2010	Examiner Sbresny, Heiko
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (FOAC01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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02-07-2010

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1507085	A1	16-02-2005	CN 1580564 A	16-02-2005
			KR 20050019042 A	28-02-2005
			US 2007065325 A1	22-03-2007
			US 2005053507 A1	10-03-2005

US 2006140804	A1	29-06-2006	CN 1793653 A	28-06-2006
			JP 2006177335 A	06-07-2006
			KR 20060072736 A	28-06-2006

US 2006177332	A1	10-08-2006	CN 1815027 A	09-08-2006
			JP 2006214430 A	17-08-2006

EP 1004773	A1	31-05-2000	CN 1272906 A	08-11-2000
			WO 9964744 A1	16-12-1999
			JP 2974009 B2	08-11-1999
			JP 11351167 A	21-12-1999

JP 58030494	A	22-02-1983	JP 1296413 C	26-12-1985
			JP 60017956 B	08-05-1985

US 4383805	A	17-05-1983	CA 1172221 A1	07-08-1984
			JP 1029994 B	15-06-1989
			JP 1545663 C	28-02-1990
			JP 57105583 A	01-07-1982

DE 19517748	A1	23-11-1995	BE 1008749 A3	02-07-1996

US 6413058	B1	02-07-2002	NONE	

JP 5071477	A	23-03-1993	NONE	
